CLAIMS

What is claimed is:

1. A computer-implemented automated decision support system for designing an auction for a given item, comprising:

a structure extractor that estimates unknown elements of market structure of the auction based on auction characteristics data extracted from historical auctions for similar items and a bidding model matching the extracted auction characteristics data;

a bidding behavior predictor that predicts bidding behaviors of bidders in the auction based on the estimated unknown elements of market structure and characteristics of the auction;

an optimizer that employs an evaluation criterion to generate an evaluation of the auction based on (1) the estimated unknown elements of market structure and (2) the predicted bidding behavior of bidders.

2. The system of claim 1, further comprising a report generator coupled to the optimizer and the structure extractor to generate a report from the evaluation of the auction.

3. The system of claim 1, wherein the optimizer selects the best auction design candidates from the evaluation of the auction, and sends these best auction design candidates to an external auction implementation system to implement the auction.

4. The system of claim 3, wherein the optimizer sends the best auction design candidates to the external auction implementation system via the Internet.

5. The system of claim 1, further comprising

a historical auction data repository that stores historical auction data for a plurality of historical auctions of a plurality of items, including items similar to the given item;

a bidding model repository that stores a plurality of bidding models.

6. The system of claim 1, wherein the structure extractor further comprises

a data selection module that accesses an external historical auction data repository for the auction characteristics data of the historical auctions for the items similar to the given item based on an user input of the given item to be auctioned;

a bidding model selection module that selects, from an external bidding model repository, the bidding model matching the auction characteristics data;

a structure estimation module that combines the extracted auction characteristics data and the bidding model to estimate the unknown elements of market structure of the auction.

7. The system of claim 6, wherein the auction characteristics data are part of the auction mechanism data that also include bid data, wherein the structure estimator estimates the unknown elements by

applying the bid data to the bidding model to invert the bidding model so as to express unobservable variables in the bidding model in terms of the observable bid data;

applying a statistical density estimation technique to the expression so as to obtain an estimate of the unknown elements.

8. The system of claim 1, wherein the behavior predictor further comprises

a bidding model selection module that selects, from an external bidding model repository, the bidding model matching the characteristics of the auction, wherein the characteristics of the auction is a user input;

a behavior prediction module that predicts the bidding behaviors of bidders in the auction by applying the estimated unknown elements of market structure into the extracted bidding model matching the user input of auction characteristics of the auction.

9. The system of claim 1, wherein the optimizer further comprises

an outcome prediction module that receives a user input evaluation criterion and a user input of candidate auction decisions to provide prediction for each of the candidate auction decisions using the evaluation criterion and based on (1) the estimated unknown elements and (2) the predicted bidding behavior of bidders;

an optimal decision module that ranks the evaluation for each of the candidate auction decisions.

10. A computer-implemented method for providing an automated auction analysis, comprising:

estimating unknown elements of market structure of the auction based on auction characteristics data extracted from historical auctions for similar items and a bidding model matching the extracted auction characteristics data;

predicting bidding behaviors of bidders in the auction based on the estimated unknown elements of market structure and characteristics of the auction;

employing an evaluation criterion to generate an evaluation of the auction based on (1) the estimated unknown elements of market structure and (2) the predicted bidding behavior of bidders.

11. The method of claim 10, further comprising the step of generating a report from the evaluation of the auction.

12. The method of claim 10, further comprising the steps of

selecting the best auction design candidates from the evaluation of the auction;

sending these best auction design candidates to an external auction implementation system to implement the auction.

13. The method of claim 12, wherein the best auction design candidates are sent to the external auction implementation system via the Internet.

14. The method of claim 10, wherein the step of estimating the unknown elements of market structure of the auction further comprises

accessing an external historical auction data repository for the auction characteristics data of the historical auctions for the items similar to the given item based on an user input of the given item to be auctioned;

selecting, from an external bidding model repository, the bidding model matching the auction characteristics data;

combining the extracted auction characteristics data and the bidding model to estimate the unknown elements of market structure of the auction.

15. The method of claim 14, wherein the step of combining the extracted auction characteristics data and the bidding model further comprises the steps of

applying bid data to the bidding model to invert the bidding model so as to express unobservable variables in the bidding model in terms of the observable bid data;

applying a statistical density estimation technique to the expression so as to obtain an estimation of the unknown elements.

16. The method of claim 10, wherein the step of predicting bidding behaviors of bidders in the auction further comprises the steps of

selecting, from an external bidding model repository, the bidding model matching the characteristics of the auction, wherein the characteristics of the auction is a user input;

predicting the bidding behaviors of bidders in the auction by applying

the estimated unknown elements of market structure into the extracted bidding model matching the user input of auction characteristics of the auction.

17. The method of claim 10, wherein the step of employing an evaluation criterion to generate an evaluation of the auction further comprises the steps of

receiving a user input evaluation criterion and a user input of candidate auction decisions to provide prediction for each of the candidate auction decisions using the evaluation criterion and based on (1) the estimated unknown elements and (2) the predicted bidding behavior of bidders;

ranking the evaluation for each of the candidate auction decisions.